cases in which a muscularis was demonstrated, both muscular layers were present. In five others, only the longitudinal coat survived. In the remaining two cases, only the circular coat could be demonstrated. By means of the Van Gieson's stain, traces of atrophied muscularis were found in several instances in which it had been overlooked in hematoxylin-eosin preparations. As a rule, we have found that the larger the diverticulum, the thinner and more atrophied is the muscularis. The circular layer is generally the first to disappear.

CONCLUSIONS. 1. Diverticulum of the intestine is a common condition.

2. The large bowel is the most frequent site, particularly the descending colon and the sigmoid.

3. Children and young adults are subject to diverticula, and to the secondary changes occurring in them.

4. All diverticula are probably true in their incipiency. The false characteristics are the results of their growth.

5. An inherent weakness existing in the muscularis is probably an important factor in the etiology of diverticula. In the small intestine this weakness appears to exist along the mesenteric attachment.

6. Diverticula undergo the same pathological changes as the appendix veriformis, and give rise to much the same general symptoms. These pathological changes are not uncommon.

We wish to express our thanks to Dr. Opie for the material from the museum of the Presbyterian Hospital; to Dr. Norris and Dr. Pappenheimer, for specimens from the Bellevue Hospital Laboratory; to Dr. Crowel, for specimens from the museum of the University and Bellevue Medical School; and to Dr. Moschowitz, for permission to include his interesting case in our series. We are also indebted to Drs. Leaming, Jachs, Agnew, and G. M. Smith, for photographs of the specimens.

SKIN RASHES IN TYPHOID FEVER.

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THE usual cutaneous manifestation seen in typhoid fever is the presence of rose spots in the form of a maculo-papular eruption appearing on the abdomen. The lesions are pale red at first, later become darker, and appear about the end of the first week, coming out in successive crops. They are usually few in number, but in some patients form a profuse eruption, covering the entire body and extremities, and are occasionally seen on the face. Sometimes the lesions are capped by tiny vesicles, at other times they are hemorrhagic. The other cutaneous lesions seen in typhoid form a very interesting group. Among these may be mentioned herpes, urticaria, sudamina, desquamation, erythema, erysipelas, purpura, furunculosis, abscess, carbuncle, impetigo, onychia, infected sebaceous cyst, decubitus, tache bleuâtre, and lineæ atrophicæ. The following description of these conditions is based on a review of the literature, and on a study of their occurrence in 1230 cases of typhoid fever, occuring in the medical services of Drs. Powell, Lowman, Upson, Cushing, and Hoover, at Lakeside Hospital; to these gentlemen I am indebted for the privilege of making this report.

Herpes were observed in 12 cases. In 8 cases they appeared on the lips during the first week of the disease. In the other 4 cases the herpetic eruption appeared late in the course of typhoid and in various regions of the body. In 1 case, a female, aged thirty-two years, a number of vesicles appeared on the forty-fourth day of her illness, a short distance outside the external canthus of her left eye and also directly above this near the hair line. Another patient, a boy, aged fifteen years, on the thirty-third day of the disease, had a small patch of herpes develop on the lower part of his chin, to the right of the median line. The third case, a male, aged fifty-two years, was afflicted with herpes over the left malar bone on the thirty-first day of his typhoid. In the fourth case, a male, aged twenty-nine years, symmetrical patches of herpes appeared on the inner and outer side of each knee, the patches on the left being more extensive. Many think that the presence of herpes labialis excludes the diagnosis of typhoid fever. That this is incorrect is shown by the 8 cases mentioned above. McCrae[1] found 20 cases of herpes in his series of 1500 patients with typhoid fever. Zinn[2] met this condition in 5 per cent. of 190 cases in the hospital at Nuremberg.

Urticaria was present in 21 cases. In some the urticarial eruption developed as a few scattered wheals on the chest or abdomen, preceding the appearance of the rose spots; in other cases it appeared later in the disease. Occasionally the lesions may cover the greater portion of the body and extremities. Miller[3] found urticaria in 2 cases in his series of 350 patients. It was formerly thought to be due to the administration of quinine, but this drug was not used in any of our patients.

A miliary eruption of sudamina is a very frequent occurrence in the third and fourth week of typhoid, when sweating is profuse. They are due to the retention of sweat drops beneath the epithelial layer of the skin. De Lacaze[4] believes that sudamina possess a definite prognostic significance. When they appear in the third or fourth week they indicate the entrance into active convalescence. My experience confirms this statement. They are usually seen on the chest and abdomen and in some cases present a striking appearance as though the skin was covered with tiny drops of water. Sudamina were present in 11 of a series of 100 cases in which a careful watch was made for this condition. Sometimes as a result there is profuse desquamation.

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[1] Modern Medicine, edited by Osler and McCrae, ii, 117.

[2] Münch. med. Woch., 1895, xlii, 486.

[3] International Clinics, vol. iii, Sixteenth Series, p. 60.

[4] Revue de méd., 1887, p. 275.

Quite extensive desquamation of the skin was noted in 83 patients. Riesman[5] has classified desquamation under the following heads: (1) Following vesicular rose spots, (2) as a result of sudamina, (3) an atrophic change analogous to shedding of hair, which usually appears in cases with severe fever. To this I would add a fourth, which would include those cases of desquamation which follow an erythematous eruption in typhoid. Rolleston[6] has reported a remarkable case of desquamation of the skin in large flakes in typhoid fever in a boy, aged ten years, who, on the fourteenth day of illness, had peeling of the skin off the thorax, thighs, and abdomen in flakes the size of a shilling. His heels and toes peeled in small scales. No cause for the peeling could be ascertained. Diehl[7] has reported an interesting case of exfoliative dermatitis in a male, aged eighteen years, who, during convalescence from an attack of typhoid fever, had a rash, consisting of minute, pin-head sized, bright red papules, appear on the wrists, and later spread to the dorsal surface of the hands and forearms up to the elbow. Later it spread to the feet, legs, and body. Intermingled with these lesions were a number of blebs the size of a half dollar. Desquamation followed in the order in which the eruption appeared.

Of the accidental skin rashes in typhoid, probably none has received as much attention as the erythemas, because of the close resemblance at times to scarlatina and the resulting difficulties in diagnosis. The first to call attention to the scarlatiniform erythema in typhoid was Murchison,[8] who stated that in many cases of enteric fever the appearance of the rose spots is preceded, for two or three days, by a delicate scarlet rash, all over the body, disappearing on pressure. He mentions the fact that Jenner relates an instance in which this rash coexisted with slight sore throat, and the disease was mistaken for scarlet fever. Murchison states that several similar instances had come under his own observation, and even goes so far as to assert that scarlet fever appears to predispose to typhoid fever. Various other writers—Graves,[9] Ohmann-Dumesnil,[10] Moore,[11] Osler,[12] Griffiths,[13] Russell,[14] Fisher,[15] and Da Costa[16]—have called attention to the presence of a scarlatiniform erythema in typhoid. The bright red eruption may be limited to the flexor surfaces or it may cover the entire body, as in one of my cases. As a rule, there is no involvement of the throat, although Da Costa has reported a case in which there was some soreness and redness of the throat. This, as a rule, has no particular significance, as occasionally the onset of typhoid is ushered in by tonsillitis. Whipham[17] has recorded a similar case in a male, aged thirty-six years, who, on the fourteenth day of his illness, developed a sore throat, with a bright erythematous eruption over the entire trunk and a less definite rash on the legs and arms. He died four days later, but his erythema had almost entirely faded before his death. Moore attributes the development of the scarlatiniform eruption, when it appears early in the course of typhoid, to a reactive inhibition of the vasomotor system of nerves; when it appears in the third week to a septicemia or secondary blood poisoning. The diffuse erythemas are usually present in the severe toxic cases, and it seems to me that they are due to an attempt of nature to get rid of the toxins through the skin; these irritate the skin, producing an erythema just as one sees in uremia, septicemia, or in cases of intestinal auto-intoxication. In reviewing the cases of this character published in the literature, one is surprised at the number that are fatal. Seven of the cases in our series showed erythema; in one it was of the type of erythema multiforme, which developed on the back and about the buttocks. Osler[18] has reported one case of erythema nodosum, in which the characteristic eruption on the legs appeared on the fifteenth day of typhoid fever.

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[5] AMER. JOUR. MED. SCI., January, 1904.

[6] Trans. Clin. Soc., London, 1889–1890, xxiii, 84.

[7] Jour. Cut. and Genito-urin. Dis., 1898, xvi. 222.

[8] Treatise on Continued Fevers of Great Britain, second edition, 1873, p. 515.

[9] Medical Record, 1890, xxxvii, 118

[10] Jour. Amer. Med. Assoc., 1890, xv, 164.

[11] Dublin Jour. Med. Sci., 1888. lxxxvi, 497.

[12] Johns Hopkins Hospital Reports, "Studies in Typhoid Fever," i, ii, iii, 471.

[13] Lancet, 1893, ii, 1307.

[14] Lancet, 1896, i, 766.

[15] Brit. Med. Jour., 1893, i, 794,

[16] Trans. Assoc. Amer. Phys., 1899, xiv, 89.

A number of cases have been reported in which true scarlet fever has developed during the course of typhoid. Sequeira[19] and Caiger[20] each have met with two such cases, and Payne[21] with one case. Griffiths[22] had the remarkable experience of seeing four children in one family who were attacked by both diseases, the onset of both fevers being almost simultaneous. Cosgrove[23] has reported five cases in which the two diseases occurred in the same individual. Carmichael[24] mentions the case of a boy, aged six years, who, after suffering from scarlet fever and going on to the stage of desquamation, continued febrile from oncoming typhoid fever. Coombs[25] and Gabe[26] have each reported a similar case.

Closely allied to the cases of typhoid complicated by erythema are those which show a rash resembling measles. Instances of this kind have been reported by Beevor,[27] Neumann,[28] and Da Costa. Beevor's patient was a probationer nurse, who, on the third day of her typhoid, had a morbilliform eruption appear on her feet, legs, chest, and upper extremities. There was no coryza or conjunctivitis, nor was the arrangement of the lesions crescentic. These two facts and the appearance of the eruption on the body in a different sequence from that seen in measles, would assist in making a correct diagnosis. In this case the rash gradually faded and was not followed by desquamation. In Neumann's patient the morbilliform eruption appeared in the third week; Da Costa's two cases also developed the rash late in the course of typhoid. The co-existence of typhoid fever and measles in the same patient has been reported by Chrystie,[29] Matiegka,[30] Ringer,[31], Ringwood,[32] and Da Costa. In the two cases reported by Da Costa there was a definite history of exposure to measles, the eruption showed the characteristic crescentic arrangement, and was preceded by coryza and conjunctivitis.

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[17] Trans. Clin. Soc., London, 1882-1883, xvi, 150.

[18] Johns Hopkins Hospital Reports, "Studies in Typhoid Fever." p. 473.

[19] Brit. Med. Jour., 1891, i, 586.

[20] Lancet, 1894, i, 1137.

[21] Ibid., 1894, p. 1264.

[22] Ibid., 1893, ii, 1307.

[23] Brit. Med. Jour., 1897, i, 29.

[24] Lancet, 1894, i, 246.

[25] Brit. Med. Jour., 1897, vol. i.

[26] Ibid., p. 848.

[27] Ibid., 1883, i, 956.

[28] Centralbl. f. klin. Med., 1890, xi, 465.

In six cases purpura was noted. One of these, a girl, aged eighteen years, developed on the twenty-third day of typhoid a purpuric spot on the second toe of the left foot; this was followed by a number of petechiæ on the outer side of both feet. A few days afterward she had hematuria and menorrhagia. She succumbed from weakness and toxemia two weeks later. Four other patients had, in the third and fourth week of the disease, petechial spots appear on the lower extremities. I have not included here the cases in which there were hemorrhagic rose spots; this condition is not very uncommon. The sixth case of purpura is so remarkable that I shall give it in detail. This patient, a female, aged eighteen years, was admitted to Lakeside Hospital May 9, 1903, with a typical history of typhoid fever, with rose spots, enlarged spleen, and a positive Widal reaction. On the sixth and seventh days after admission she had two copious intestinal hemorrhages. At the same time several large purpuric spots appeared on the abdomen—one just above the pubis and another at the site of an old appendiceal scar being much larger than the others. There were also a few petechiæ over the anterior surface of the left ankle, one over the second toe of the left foot and a small ecchymosis over the great toe of the right foot. The patient complained of some burning in the ecchymotic areas of the abdomen. This was relieved by the application of hot compresses. In the course of a few days the ecchymoses on the abdomen became much darker in color, and at the end of a week a central slough had separated, leaving a ragged ulcer in the region of McBurney's point, and another just above the pubis (see Fig. 1). The patient died three weeks after admission from toxemia.

Such superficial gangrene of the skin is very rare. Taupin[33] mentions a case of sloughing of the thighs, sacral region, knees, elbows, and of the face, in a child with typhoid fever. The skin became violaceous in appearance, and mortified, and this was accompanied by increase in the delirium. Hare and Beardsley[34] have reported a case in which the gangrene developed on the inside of the left calf of a girl, aged nineteen years, who had suffered some days before from a series of profuse hemorrhages. Two brown ecchymotic spots formed on the heels, but did not slough. The separation of the slough was accompanied by loss of power and sensation in the anterior part of the leg, evidently from peripheral neuritis. A very extraordinary series of ten cases of gangrene of the skin has been reported by Stahl,[35] which occurred in soldiers. Two cases in children have been reported by Jacobi,[36] and Abt.[37] McFarland[38] has also reported a series of patients in which gangrene of the skin resulted from typhoid fever. Nicholls[39] has recorded four cases in which late in the disease the hemorrhagic diathesis developed, the patients having hemoptysis, hematemesis, and hemorrhages from the bowels. A somewhat similar instance is reported by Hughes and Levy.[40]

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[29] Univ. Med. Mag., December, 1888.

[30] Prager med. Woch., September 25, 1889.

[31] Lancet, June 30, 1889.

[32] Ibid., July 7, 1889.

[33] Jour. des Con. méd.-chir., 1839, No. 7 (quoted by Hare and Beardsley, p. 177).

In four patients a pemphigoid eruption was present. In one, a girl, aged seven years, a single large bleb appeared on the dorsum of the right hand. Cultures from the contents of the bleb showed Staphylococcus pyogenes aureus. In a second case a large bulla, surrounded by a red areola, appeared on the left shin, below the knee. The third case had two bullæ, one on the dorsum of the left hand, the other in the left axilla. In the fourth patient there were two bullæ, the size of a dime, on the right buttock. In all these patients the eruption appeared in the third and fourth week of the typhoid. Osler[41] has reported one similar case.

Two cases of erysipelas occurred in this series. This complication is seen late in the course of a typhoid, when the resistance of the patient is very much reduced. The first patient, a man, aged twenty-seven years, developed during the third week of his typhoid an erysipelatous eruption on the cheeks, with a marked rise in temperature, chills, and leukocytosis. The eruption spread over the face and scalp, and after running its usual course, he recovered. The second patient, a male, aged twenty years, in the fourth week of typhoid fever, following a purulent otitis media, was afflicted with erysipelas, beginning over the right parotid. It spread so as to involve the face and the greater part of the scalp. He made a good recovery.

Curschmann[42] claims that the principal reason that erysipelas is more common late in the course of typhoid, and during convalescence, resides in the fact that at this time bedsores and other ulcerative processes form a favorable starting point for this complication. Among 1420 cases Liebermeister[43] saw erysipelas occur in ten. Of these, eight had facial erysipelas; in the other two, the disease developed about bedsores. Griesinger[44] noted fatal erysipelas in 2 per cent. of 500 cases observed at Zurich. Hare and Beardsley[45] have reported three cases of facial erysipelas in women, complicating typhoid, that occurred within a period of six weeks of each other in the wards of St. Agnes' Hospital. The first case was separated from the second by an interval of five weeks, and the second from the third by less than a week. They were all in the same ward but occupied beds at least twenty feet apart. They all made a good recovery. In one there was chronic suppuration of the middle ear. In the collected statistics of Hare and Beardsley erysipelas was found recorded sixty-four times in 3910 typhoid patients, which is about 1 to 61, the proportion given by Gerente. Other interesting cases of this complication have been described by Thielman,[46] Berthoud,[47] Armiex,[48] Freudenberger,[49] Potain,[50] and Martine.[51] Silverstrini[52] has reported two cases of facial erysipelas in typhoid fever, in which the inflammation was found to be due to the bacillus of Eberth, and not to streptococci.

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[34] Typhoid Fever and Exanthemata, second edition, 1909, p. 177.

[35] Quoted by Hare and Beardsley, p. 178.

[36] Arch. Péd., December 15, 1899.

[37] Jour. Amer. Med. Assoc., 1901, xxxvii, 445.

[38] Quoted by Hare and Beardsley, p. 179.

[39] Montreal Med. Jour., June, 1906.

[40] Arch. de méd. et de phar. mil., August, 1892 (quoted by Hare and Beardsley, p. 179).

[41] "Studies in Typhoid Fever," Johns Hopkins Hospital Reports, p. 476.

[42] Nothnagel's Encyclopedia of Practical Medicine, Typhoid and Typhus Fevers, 1901, p. 324.

There were twelve cases of bedsores. Their most frequent site is over the sacrum, although they may be found over the occiput, the vertebral spines, the spine of the scapula, the great trochanter, the tuberosity of the ischium, and even over the heels. In some of our cases the bedsores were present on admission, owing to lack of careful nursing at home. In others the patients had severe intestinal hemorrhages, so that for a few days they were moved as little as possible. It seems to me that often more harm is done by keeping the patient in the dorsal position after a hemorrhage than would result from careful movement, because of the frequent development of bedsores. In very toxic cases they are likely to occur because of the involuntary micturition and defecation.

Under the heading of septic conditions of the skin there were noted in this series 45 cases of furunculosis, 2 of carbuncle, 5 of onychia, 9 of abscess, 1 of impetigo, and 1 of infected sebaceous cyst of the head. These cutaneous infections appear in the late stages of typhoid, when the course of the disease has been much protracted and when the patient's vitality has been considerably reduced. Edsall[53] has described a series of cases of typhoid in which furunculosis occurred about the buttocks, the infection evidently being spread by the bedpan. I have been unable to establish a similar method of infection in any of our cases. Carbuncles were present in two cases, in both of which they occurred during the stage of convalescence. In the one instance the carbuncle was situated on the outer side of the left leg, a short distance above the ankle; in the other, on the back in the lumbar region. Hare and Beardsley[54] mention one case in which the patient had a carbuncle on the back, which appeared about the twelfth day of an attack of typhoid, and persisted during a relapse and well into the second convalescence.

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[43] Quoted by Hare and Beardsley, p. 253.

[44] Quoted by Curschmann in Nothnagel's Encyclopedia, Typhoid and Typhus Fevers, p. 325.

[45] Typhoid Fever and Other Exanthemata, second edition, Lea & Febiger, 1909, p. 253.

[46] Quoted by Hare and Beardsley, p. 257.

[47] Ibid., p. 258.

[48] Ibid., p. 257.

[49] Ibid., p. 258.

[50] Ibid., p. 259.

[51] Ibid.

[52] Ibid.

[53] Univ. Penna. Med. Bull., March, 1904.

There were five cases of onychia; with one exception, these were in children. They are very painful, but heal readily with proper treatment. Abscesses were present in nine patients; these were in various situations over the lower third of the tibia, in the ischiorectal fossa, in the vulvo-vaginal, gluteal, axillary, alveolar folds, in the groin, and in front of the right ankle. They are usually subcutaneous, but in some cases they may extend into the muscles. Impetigo was seen in one case. In another patient there was an infected sebaceous cyst of the head.

Another form of skin manifestation in typhoid is the tache bleuâtres, which Hare and Beardsley state were first described as occurring in typhoid by Piednagel, in 1837. The majority of observers will agree with Hewetson,[55] that they are usually, if not always, associated with the presence of pediculi. I have seen them in dispensary patients suffering from conditions other than typhoid, but in whom pediculi were present. They are steel-gray spots, 4 to 10 mm. in diameter, of irregular outline, and most abundant about the chest, abdomen, and thighs.

A very unusual lesion of the skin in typhoid is the development in children and young adolescents, especially when the disease has run a very long course and when the growth in height of the patient has been very rapid, of striæ patellares. A very interesting case of this kind came under my observation. A boy, aged fourteen years, was admitted to Lakeside Hospital May 16, 1906, suffering from a severe attack of typhoid fever. The disease ran a very long course, the complications being bronchitis, intestinal hemorrhage, and relapse. During his prolonged stay in bed he became very emaciated. He lay the greater part of the time with his knees slightly flexed and the toes extended, so that the skin was stretched. On July 2 he called our attention to some reddish scars, which were irregularly situated, in front of his knees and ankles, and appeared as if a superficial incision had been made, leaving the edges gaping open. On the anterior surface of the lower third of the leg there were in all nineteen of these scars, irregularly placed, the lowest being on a

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[54] Typhoid Fever and Other Exanthemata, second edition, 1909, p. 177.

[55] Johns Hopkins Hosp. Bull., v. 19.

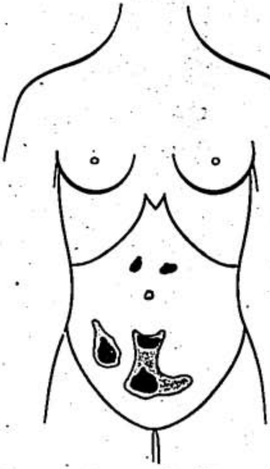

FIG. 1.—Showing the areas of ecchymoses on the abdomen. The darker areas represent the ulcers after sloughing.

FIG. 2.—Showing the striæ about the knees.

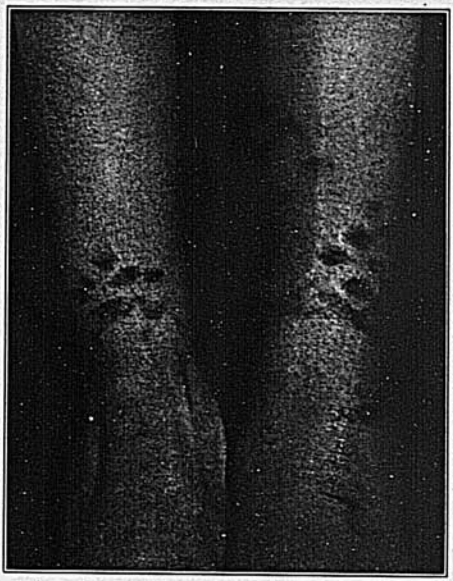

FIG. 3.—Showing the striæ above the ankles.

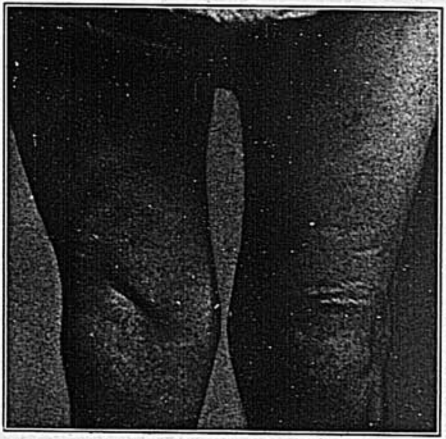

FIG. 4.—Showing white, irregular, transverse scars above the patellæ.

level with the tip of the internal malleolus, the highest 14.5 cm. above this point. They lay transversely, and varied in length from 1 cm. to 3 cm. The average width of the striæ was 9 cm. Directly over the centre of the patella, and extending transversely, was one of these striæ, 2.5 cm. in length, 0.25 cm. in width. In the median line over the anterior surface of the lower part of the thigh, 7 cm. above the transverse scar over the centre of the patella, was a linear transverse scar, 2 x 0.5 cm. in size. Three others of varying length were situated below the one over the middle of the patella. In all there were twenty-four of these lesions on the left extremity. On the right there were eighteen striæ, situated in positions similar to those on the left, making a total of forty-two. The positions of these striæ are seen in the accompanying pictures (Figs. 2 and 3). They were a delicate pink color, in marked contrast to the surrounding skin, and were painless, causing the patient no inconvenience whatever. There were no sensory disturbances in this case. During the patient's prolonged stay in bed he grew about four inches in height, and it seems to me that the most reasonable explanation of the striæ is the stretching of the skin from the rapid growth, the vitality of the tissues being much lowered. The occurrence of the lesions in the situations referred to was due to the fact that here, from the partially flexed position of the knees and the extension at the ankles, the skin was on a tension, and, besides, the growth is very rapid at the epiphyses of the long bones.

After seeing this case, I inspected the knees, for the presence of these scars, of every patient admitted to the medical wards. Four months later I was rewarded by finding them in front of the knees of a woman, aged forty-two years, admitted for a chronic condition, and who, when fifteen years old, had been afflicted with a severe and prolonged typhoid. She had a series of white, irregular, transverse scars just above the patellæ (Fig. 4).

This unusual condition of patellar striæ was first described by Wilks[56] in the case of a lad who had been confined to bed for the greater part of the time for six years, with disease of the knee-joint. He had three transverse stripes of a pale color in front of his knee, appearing as if a piece of skin had been removed and the edges never approximated, or as if a single incision had been made and the wound, gaping open, had been filled up with some loose texture. Over the instep of the right foot were several transverse scars lying parallel with one another. Similar but less distinct scars were found on the dorsum of the left foot. No mention was made of typhoid fever in this case. Bradshaw[57] records the case of a girl, aged thirteen years, who had a severe attack of typhoid, with two relapses. On the ninety-eighth day, because of some difficulty in walking, he was led to examine the lower extremities, and found over the anterior surface of the lower third of the thighs and the patella five or six horizontal markings, the longest reaching to about one-third the circumference of the limb, and being about half an inch in width. The smallest was under an inch in length and narrow in proportion. On flexing the knee the pink portions became smooth and shiny. On placing the finger on the markings a distinct depression was felt, as if there were a crack in the true skin, filled up with a thin layer of cuticle. There were no sensory disturbances in this case.

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[56] Guy's Hosp. Reports, vii. 1861.

[57] Liverpool Medico-Chirurgical Journal, July, 1888.

Shepherd[58] records the presence of these striæ in a boy, aged fifteen years, with typhoid, which ran a long severe course, and was complicated by double parotitis, with paralysis of the right facial nerve, paresis of the lower limbs, and fits of an epileptic character, with a mild form of dementia. Two months after admission he had well marked striæ over both patellæ and above both knees, purplish in color and elliptical in shape, tapering to a fine point at each end. The largest was six inches in length and half an inch in breadth at the middle. Troisier[59] has noticed this complication in young adults and children. Northrup[60] describes and figures the striæ above the knees in a lad, aged seventeen years, after a protracted course of typhoid. He said they were at first reddish, like "welts made by a switch." Fisher[61] has recorded a case in which the striæ developed above the knees after typhoid in a girl, aged thirteen years. Sir Dyce Duckworth[62] records unilateral striæ on the thighs in a patient, aged fifteen years, following typhoid. In this case there was accompanying hyperesthesia in the distribution of the external and middle cutaneous nerves. Köbner[63] reports two cases in girls, aged thirteen and fourteen years, with the characteristic lesions in front of the knee. One of these cases he saw twenty-three years afterward, and she was found to have broad white scars at the site of the lesions. Other cases of patellar striæ following typhoid have been described by Barie,[64] Kaposi,[65] Langer,[66] Gubler,[67] Bouchard,[68] Nonne,[69] and Bunch.[70]

As seen from the descriptions given above, the most frequent site for these lesions is over the lower part of the anterior surface of the thigh and in front of the patella, though they may occur in other parts of the body and in other conditions besides typhoid. This Pflagge[71] has noticed them, after typhus fever, occurring on the abdomen, where there had been no distention of the parietes. They have been noted even on the arm and over the knuckles of the hand (Barie). Bucquoy[72] has stated that in boys these lines may have no special areas of distribution, but in girls the breasts and crests of the ilium are the places where they usually appear. With this statement I cannot agree, as no such cases have occurred in over 1300 cases of typhoid treated at Lakeside Hospital. My own case is the only one in which extensive lesions have been described over the anterior surface of the lower part of the leg and in front of the ankle. Striæ have also been described in phthisical patients and in children suffering from colitis. They always leave permanent scars because the true skin is affected.

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[58] Trans. Amer. Dermat. Assoc., 1890, xiv, 23.

[59] Bull. et mem. de la Soc. méd. des hôpitaux, 1889, No. 12.

[60] Trans. Assoc. Amer. Phys., 1903.

[61] Münch. med. Woch., 1904, 482.

[62] Brit. Jour. Dermat., 1893, p. 357.

[63] Münch. med. Woch., 1904, p. 928.

[64] Sem. méd., 1888, p. 259.

[65] Diseases of the Skin, Hebra, vol. iii, 262.

[66] Anseiger der k. k. Gesell. der Aerzte in Wien, No. 28, 1879.

[67] Quoted by Bunch, Brit. Jour. Dermat., 1905, xvii.

[68] Ibid.

[69] Ibid.

[70] Brit. Jour. Dermat., 1905, xvii.

[71] Zeitschr. f. die Staatsarzneikunde, 1861, xv, 369.

Many causes have been given for their appearance. Barie, because there was an accompanying herpes zoster in his case, considers this conclusive of their nervous origin. In support of this Sir Dyce Duckworth found hyperesthesia of the skin in the distribution of the middle and external cutaneous nerves in his case. The most reasonable and probable explanation is that given by Bunch and others, that they are due to the stretching of the skin from excessive growth of the long bones, either from want of pressure on the epiphysis or from a juxta-epiphyseal osteitis. Bunch states that the histological changes found consist in a diminution in the interlacing of the elastic fibers and a thinning of the white fibrous tissue. The elastic fibers show a parallel arrangement which has been brought about at the expense of the crossing transverse elastic fibers which have ruptured and retracted to the edge of the lesion. In the centre of the lesion, therefore, the total number of elastic fibers was less than that found in healthy skin, and those were more or less parallel to one another. At the edge of the lesion were the broken ends of the missing elastic fibers which had retracted, and the elastic tissue here appears denser than normal. In the pars reticularis of the corium these changes were best marked, and the more slender fibrils of the elastic network seemed to have suffered most. The branching fibrils which surround the sweat glands and hair follicles tend, no doubt, when dragged upon, to cause a deflection of these glands and follicles. Troisier and Menetrier[73] have also described an alteration in the course of the bloodvessels due to the same cause, but the sections of Bunch did not show this. In addition to these changes in the corium, there was slight thickening of the prickle cell layer, but the lesion was essentially one involving the corium more than the papillary layer and prickle cells. There was some round-cell infiltration around the bloodvessels. Kaposi, however, has examined the skin in those cases and found the epidermic layer and the mucous layer much atrophied. The papillæ had entirely vanished. Langer asserts that these lesions are not due to rupture but to disarrangement of the connective tissue. The connective tissue bundles form rhomboid meshes which, when the integument is distended, stretch most readily in the long axis. He says the striæ are the result of violent stretching, the bundles in part becoming parallel and remaining in position.

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[72] Quoted by Hare and Beardsley.

[73] Arch. de méd. expér., 1889, p. 134.

EXTENSIVE SARCOMA OF THE HEART, INVOLVING THE BUNDLE OF HIS.

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Whatever be the real causation of the heart beat, and through whatever agency the rhythm of the heart is maintained, there is no doubt that recent studies of the anatomy of the heart itself have thrown considerable light on the subject, and the work of Tawara, His, Keith, and many others, has led one to believe that the explanation is nearing a solution.

Passing from the earlier authorities, whose views as to the heart's action were based on a belief that the blood itself, circulating through the chambers, was responsible for the individual beat, we were brought to consider the heart tissue as having some special function whereby the action, more or less automatic, was maintained in the absence of external control. When, however, the researches of anatomists and neurologists led us to see that ganglion cells and nerve fibers were present in abundance, the so-called neurogenic theory took its place as of paramount importance, and the heart's action was regarded as primarily subservient to the nervous mechanism of the body—the ganglia in the heart tissues originating the individual beats. Gaskell's researches, however, led to the myogenic theory, according to which the muscle cells themselves were possessed of a power independent of the nervous system, and by means of which stimuli originated and conduction and contractility were maintained.

When, however, ten years later (1893), Kent and His demonstrated special muscle bundles leading from the right auricle to the two ventricles, and with the further work of Keith, Flack, Erlanger. Gibson, Mackenzie, and many others, it was shown that the various functions of irritability, contractility, and conductivity depended in no small degree on the integrity of these muscular strands, a new